Abstract of the Invention

A method and apparatus is disclosed for performing blind source separation using convolutive signal decorrelation. For a first embodiment, the method accumulates a length of input signal (mixed signal) that comprises a plurality of independent signals from independent signal sources. The invention then divides the length of input signal

5   into a plurality of T-length periods (windows) and performs a discrete Fourier transform (DFT) on the signal within each T-length period. Thereafter, estimated cross-correlation values are computed using a plurality of the averaged DFT values. A total number of K cross-correlation values are computed, where each of the K values is averaged over N of the T-length periods. Using the cross-correlation values, a gradient descent process

10   computes the coefficients of a FIR filter that will effectively separate the source signals within the input signal. A second embodiment of the invention is directed to on-line processing of the input signal – *i.e.*, processing the signal as soon as it arrives with no storage of the signal data. In particular, an on-line gradient algorithm is provided for application to non-stationary signals and having an adaptive step size in the frequency

15   domain based on second derivatives of the cost function. The on-line separation methodology of this embodiment is characterized as multiple adaptive decorrelation..